

An Integrated Heavy Fuel Piston Engine Ducted Fan Propulsion Unit for Personal Air Vehicles, Phase I

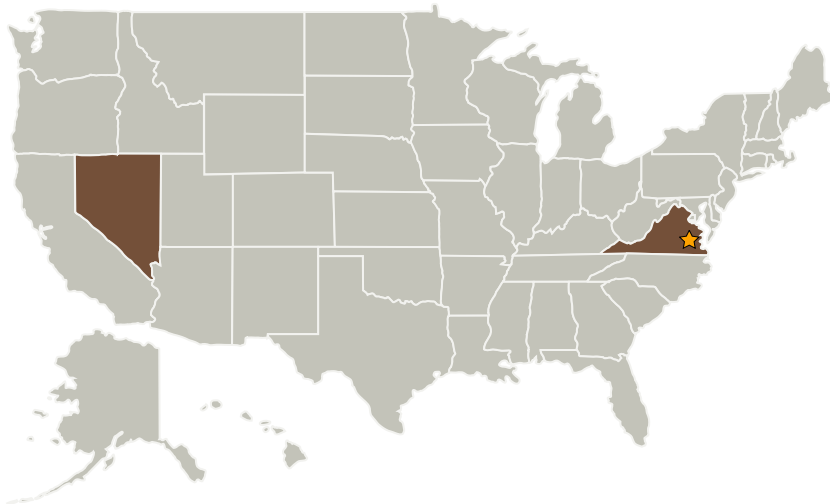
Completed Technology Project (2004 - 2005)



Project Introduction

The proposed PAVE propulsion system technology demonstration combines an innovative high-speed aero-diesel engine with a novel ducted fan assembly resulting in a low noise/cost and high performance propulsion system. The core engine makes extensive use of a novel self-injection, compression ignition/combustion system capable of high-speed operation on kerosene-based fuels without degradation due to variations in fuel viscosity, lubricity and cetane value. Propulsion system safety is greatly enhanced by inherent single lever control, the employment of high flash point fuel, and the absence of fuel injection system degradation when operating on variable viscosity/lubricity Jet-A fuel having unregulated cetane values. Competing aero-diesel developments are dependant on OEM fuel system manufactures that are not willing to sell their system intended for aviation use due to the low lubricity of Jet fuel and the high product liability of General Aviation industry. On the contrary the preferred self-injection system does not require any specialized equipment to produce and is comparable in cost to a carburetor. The multi-fuel combustion system is controlled by the "Fuel deposit on the wall" method of injection. The controlled combustion is characterized by having modest pressure rise and virtually absent combustion noise thus eliminating the classic "diesel knock" and greatly improving the noise, vibration, and harshness (NVH) of the installation.

Primary U.S. Work Locations and Key Partners



An Integrated Heavy Fuel Piston Engine Ducted Fan Propulsion Unit for Personal Air Vehicles, Phase I

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

An Integrated Heavy Fuel Piston Engine Ducted Fan Propulsion Unit for Personal Air Vehicles, Phase I

Completed Technology Project (2004 - 2005)



Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
GSE Inc	Supporting Organization	Industry	Incline Village, Nevada

Primary U.S. Work Locations	
Nevada	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.1 Chemical Space Propulsion
 - └ TX01.1.5 Hybrids